11/20/13 Agenda

- Warm Up

- Review Test

- Review HW - Worksheet 3
  - Medians & Altitudes

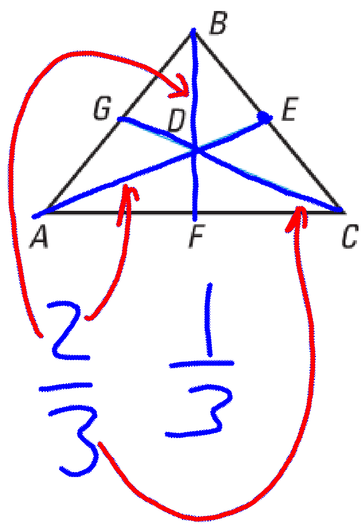
- Section 5.3 - Angle Bisectors

- Start Homework
  - Worksheet 4 - Angle Bisectors

Warm Up

xy **ALGEBRA** **Point D is the centroid of $\triangle ABC$. Use the given information to find the value of x.**

WHERE MEDIANS INTERSECT



33. $BD = 4x + 5$ and $BF = 9x$

34. $GD = 2x - 8$ and $GC = 3x + 3$

35. $AD = 5x$ and $DE = 3x - 2$

$BD = \frac{2}{3} BF$

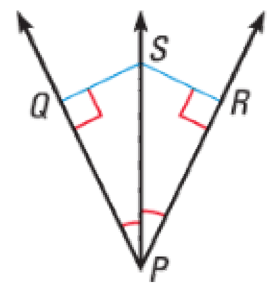
$4x+5 = \frac{2}{3}(9x)$

$4x+5 = 6x$

$5 = 2x$ $\quad x = 2.5$

Section 5.3 - Angle Bisectors   Target 5C

Goal:	Solve problems involving angle bisectors of a triangle.
Recall from Chapter 1:	An ***angle bisector*** is a ray that divides an angle into two congruent adjacent angles.
Recall also:	The *distance from a point to a line* is the length of a perpendicular segment from the point to the line.



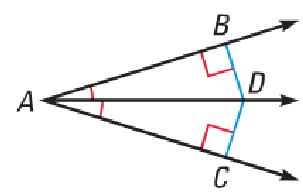
THEOREMS *For Your Notebook*

THEOREM 5.5 Angle Bisector Theorem

If a point is on the bisector of an angle, then it is equidistant from the two sides of the angle.

If $\overrightarrow{AD}$ bisects $\angle BAC$ and $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$, then $DB = DC$.

Proof: Ex. 34, p. 315

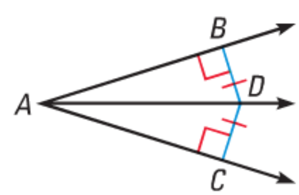


THEOREM 5.6 Converse of the Angle Bisector Theorem

If a point is in the interior of an angle and is equidistant from the sides of the angle, then it lies on the bisector of the angle.

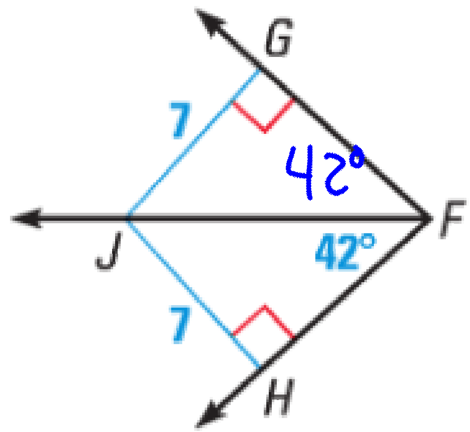
If $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$ and $DB = DC$, then $\overrightarrow{AD}$ bisects $\angle BAC$.

Proof: Ex. 35, p. 315

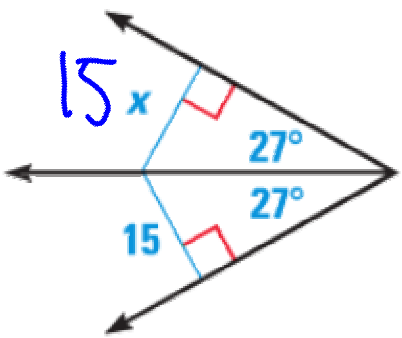


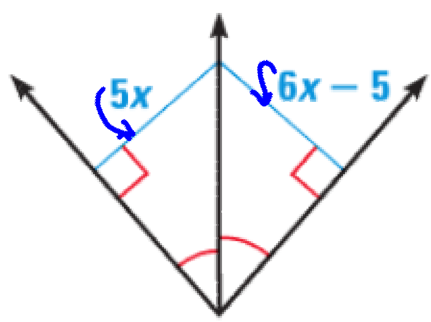
Section 5.3 - Angle Bisectors Target 5C

Find the measure of $\angle GFJ$.



find the value of x.





$5x = 6x - 5$

$x = 5$

Section 5.3 - Angle Bisectors Target 5C

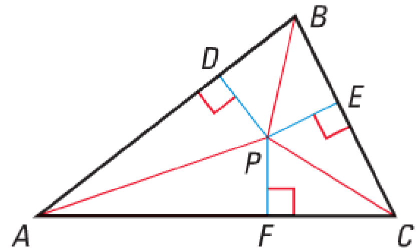
THEOREM *For Your Notebook*

THEOREM 5.7 Concurrency of Angle Bisectors of a Triangle

The angle bisectors of a triangle intersect at a point that is equidistant from the sides of the triangle.

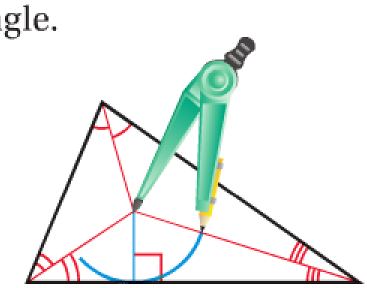
If $\overline{AP}$, $\overline{BP}$, and $\overline{CP}$ are angle bisectors of $\triangle ABC$, then $PD = PE = PF$.

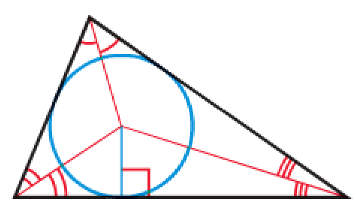
Proof: Ex. 36, p. 316



The point of concurrency of the three angle bisectors of a triangle is called the **incenter** of the triangle. The incenter always lies inside the triangle.

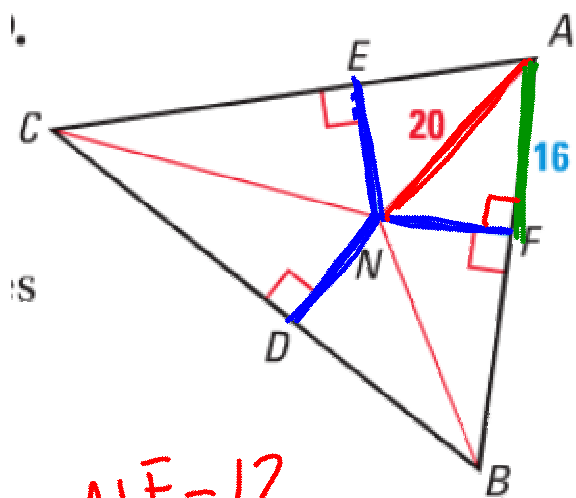
Because the incenter P is equidistant from the three sides of the triangle, a circle drawn using P as the center and the distance to one side as the radius will just touch the other two sides. The circle is said to be *inscribed* within the triangle.





In the diagram, N is the incenter of $\triangle ABC$. Find ND.

ND = EN = NF



$a^2 + b^2 = c^2$

$20^2 = 16^2 + a^2$

$400 = 256 + a^2$

$144 = a^2$

NF = 12

Section 5.3 - Angle Bisectors Target 5C

Find the value of *x*.